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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,746	12/24/2003	Masaharu Itaya	MAM-036	9105

20374 7590 10/11/2007  
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EXAMINER
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DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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10/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/743,746	<b>Applicant(s)</b> ITAYA ET AL.	
	<b>Examiner</b> Tracy Dove	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 August 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-4,7-11 and 14-21 is/are pending in the application.
- 4a) Of the above claim(s) 2,3,7,8,17,18,20 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4,9-11,14-16 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 8/7/07. Applicant's arguments filed 5/1/07 have been considered, but are not persuasive. Claims 2-4, 7-11 and 14-21 are pending. Claims 2, 3, 7, 8, 17, 18, 20 and 21 are withdrawn from consideration. This Action is FINAL, as necessitated by amendment.

#### ***Election/Restrictions***

Applicant's election without traverse of Group II in the reply filed on 8/7/07 is acknowledged. The elected species for the magnesium salt is magnesium bistrifluoromethanesulfonimide and the elected species for the organic solvent is dimethoxyethane. Claims 4, 9-11, 14-16 and 19 read on the elected species.

#### ***Claims Analysis***

Claim 4 recites "for a nonaqueous battery", which is not given patentable weight because it is an intended use limitation.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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Claims 4, 9-11, 14-16 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshimoto et al., Electrochimica Acta 46 (2001) 1195-1200, Ionic conductance of polymeric electrolyte consisting of magnesium salts dissolved in cross-linked polymer matrix with linear polyether (Yoshimoto1).

Yoshimoto1 teaches the conductivity of the electrolyte depends of the kind of dissolved magnesium salt. The highest conductivity was obtained for the polymeric electrolyte containing  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$ . A Mg/Mg cell using the polymeric electrolyte proved that  $\text{Mg}^{2+}$  is mobile (abstract). The magnesium ion is mobile and electrochemically active (page 1195). Polymeric gel systems swollen with aprotic solvents such as propylene carbonate have been proposed as high  $\text{Mg}^{2+}$  conductors. The polymeric system of Yoshimoto consists of oligo(ethylene oxide)-grafted polymethacrylate matrix and *linear polyether which dissolves magnesium salts* (1196). The electrolytic salt may be  $\text{Mg}(\text{ClO}_4)_2$ ,  $\text{Mg}(\text{CF}_3\text{SO}_3)_2$  or  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$  (1196; col. 1). A solvent such as N,N-dimethyl formamide (DMF) can be used to improve the conductivity of the electrolyte (1200). Thus the claims are anticipated.

\*

Claims 4, 9 and 10 are rejected under 35 U.S.C. 102(a) as being anticipated by Yoshimoto et al., Electrochimica Acta 48 (2003) 2317-2322, Rechargeable magnesium batteries with polymeric gel electrolyte containing magnesium salts (Yoshimoto2).

Yoshimoto2 teaches polymer gel electrolyte with magnesium imide  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$  as the electrolytic salt and mixed alkyl carbonates as the plasticizer. The highest conductivity was obtained for EC+DMC (ethylene carbonate+dimethyl carbonate) dissolving  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$  (abstract). Thus the claims are anticipated.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 9-11, 14-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaura et al., US 6,426,164 in view of Armand, US 5,072,040.

Yamaura teaches a non-aqueous electrolyte battery incorporating magnesium as a charge carrier. The non-aqueous electrolyte, disposed between a negative electrode and a positive electrode, contains a non-aqueous solvent and an electrolyte constituted by magnesium salt (abstract). The negative electrode may be magnesium or an alloy of magnesium (2:58-62). Since magnesium ions are diffused into the positive electrode, the positive electrode includes magnesium (3:5-42). The magnesium salts are listed at column 3, lines 63-67. The solvents are listed at column 4, lines 1-14. The solvent may be dimethoxyethane or a carbonate.

Yamaura does not explicitly state the magnesium salt is  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$ . However, Armand teaches the preparation of  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$  (Example 4). Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Armand teaches perfluorosulfonylimides are useful as salts in liquid electrolyte. One of skill would have been motivated to use the  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$  magnesium salt for the magnesium salt of Yamaura because Armand teaches such magnesium salts are useful for liquid electrolytes. Armand teaches aprotic polar solvents in column 3, lines 26-32.

***Response to Arguments***

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Applicant's arguments filed 5/1/07 have been fully considered but they are not persuasive. Applicant argues Yoshimoto1 does not disclose the combination of magnesium bistrifluoromethanesulfonimide and the organic solvent (dimethoxyethane) recited in claim 4. However, Yoshimoto1 teaches the polymeric system includes a linear polyether (dimethoxyethane is a linear polyether) that dissolves magnesium salts (1196). Therefore, Yoshimoto1 teaches the combination disclosed by claim 4.

Regarding the 35 USC 102(a) rejection in view of Yoshimoto2, Applicant argues the reference is not available as prior art against the claimed invention because the English translation of the foreign priority document perfects applicant's claim to priority and overcomes the rejection based on Yoshimoto2. However, the translation does not provide support for claims 11 and 19 regarding the positive and/or negative electrode active materials. Therefore, Yoshimoto2 is still applicable as prior art against the claimed invention.

Applicant asserts one of skill would not have been motivated to use the Mg salts of Armand in the electrolyte solvent of Yamaura because most Mg salts are insoluble in an organic solvent. Applicant has not provided any evidence to support this assertion. Furthermore, Yamaura teaches that dimethoxyethane dissolves magnesium salts. Armand teaches the preparation of  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$  (Example 4). Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Armand teaches perfluorosulfonylimides are useful as salts in liquid electrolyte. One of skill would have been motivated to use the  $\text{Mg}[(\text{CF}_3\text{SO}_2)_2\text{N}]_2$  magnesium salt for the magnesium salt of Yamaura because Armand teaches such magnesium salts are useful for liquid electrolytes. Armand teaches aprotic polar solvents (such as dimethoxyethane) in column 3, lines 26-32.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

October 5, 2007

  
TRACY DOVE  
PRIMARY EXAMINER  
10/07